National Transportation Safety Board
Office of Research and Engineering
Washington, DC 20594

ERA22FA399

VEHICLE PERFORMANCE

6/22/2023
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A. ACCIDENT

Location: Bay City, Wisconsin
Date: September 6, 2022
Time: 1325 CDT
1825 GMT
Airplane: Experimental Glasair Super II SFT, N11HC

B. VEHICLE PERFORMANCE

No airplane performance group was formed.

C. SUMMARY

On September 6, 2022, at 1325 central daylight time (CDT), an experimental, amateur-built Glasair Super II SFT airplane, N11HC, was destroyed when it was involved in an accident in Bay City, Wisconsin. The flight instructor and a commercial pilot-under-instruction were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

The flight departed from Rochester Regional Airport (RST), Rochester, Minnesota about 1218. Following some air work, the flight proceeded to Red Wing Airport (RGK), Bay City, Wisconsin and entered left traffic for the visual airport traffic pattern to runway 9. According to Automatic Dependent Surveillance-Broadcast (ADS-B) data, four circuits of the traffic pattern were flown without landing and a fifth traffic pattern was initiated. The ADS-B data indicated that the airplane turned onto the base leg of the airport traffic pattern about 1 mile sooner than on the previous approaches. A witness reported that the airplane, while on base leg, banked sharply to the left and pointed nose down before it crashed. The airplane impacted the ground about 1/3 nautical mile (NM) west-northwest of runway 9. See Figure 1.

Times in the study are quoted in CDT. Greenwich Mean Time (GMT) = CDT + 5 hr.

D. THE AIRPLANE

A picture of the accident airplane, an Experimental Glasair Super II SFT, is shown in Figure 2. The kit airplane was built in 2012 and is registered to Philip J. Conway.

E. WEATHER SUMMARY

A routine weather observation for RGK about ten minutes after the accident was reported as:

METAR KRGK 061835Z AUTO 14005KT 10SM CLR 26/17 A3011 RMK AO2

The automated surface weather observation at Red Wing Regional Airport on September 6 at 1335 CDT is wind from 140˚ at 5 knots (kt); 10 statute miles visibility; clear skies; temperature 26˚ Celsius (C); dew point 17˚C; altimeter 30.11" of mercury.

F. AIRPLANE PERFORMANCE STUDY

The data used in the airplane performance study were downloaded from the airplane's Garmin G3X integrated flight instrument system. The G3X provides pilots with a single or split-screen option to display primary flight display (PFD) information, multi-function display (MFD) information, e.g., moving map, and/or engine information. The position, airspeed, acceleration, attitude, and engine data are also recorded by the G3X.

Figures 3 and 4 show G3X parameters for the entire one hour and five-minute flight. Speed and altitude information indicate that N11HC first climbed to about 10,000 ft to perform a series of level, 60˚, 2g turns. The air work lasted for approximately 45 minutes. The airplane then descended at over 4,400 fpm north towards RGK for pattern work that lasted the remainder of the flight. The pilots performed four low passes and the airplane crashed on the fifth.

Figures 5 and 6 indicate that the fifth approach (base to final turn just prior to impact) was flown at a higher descent rate, bank angle, and pitch attitude. The descent rate approached 2,500 fpm, the left bank angle reached 100˚, and the pitch attitude was 15˚ airplane-nose-down.

Figures 7 and 8 highlight the last two minutes of the flight. Based on recorded airspeed, attitude, and acceleration data, it does not appear that the airplane experienced an aerodynamic stall. The normal load factor (n_z) shown in Figure 9 indicates that the wing was likely producing lift that resulted in a positive normal load factor between 1g and 2g's right before the G3X data ended[1].

Figure 9 also indicates that the lateral acceleration was at 0.3g when the data ended. The magnitude is significant and is likely the result of a high sideslip angle.

[1] A stalled wing is less likely to produce the positive normal acceleration recorded by the G3X.

G. SUMMARY AND CONCLUSIONS

Based on Garmin G3X data downloaded after the accident, it appears that N11HC impacted terrain descending at over 1,500 fpm in a 100˚ left bank while on base and turning final to runway 9 at Red Wing Airport in, Bay City, Wisconsin. The accident occurred on N11HC's fifth approach to runway 9, and the base leg was flown approximately 0.5 to 1.0 NM tighter than the previous four passes. Based on the recorded airspeed, attitude, and acceleration data, an aerodynamic stall does not appear likely.

The recorded lateral acceleration is consistent with a high sideslip angle, i.e., a forward slip. Forward slips are used to increase the descent rate while maintaining a relative constant airspeed, most commonly used when an airplane is high on approach.

It is not known who was flying N11HC at the time of the accident. The flight instructor had accumulated two hours in the accident airplane, while the commercial pilot-under-instruction had zero hours in the airplane before the accident flight.

Submitted by:

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National Transportation Safety Board

H. FIGURES

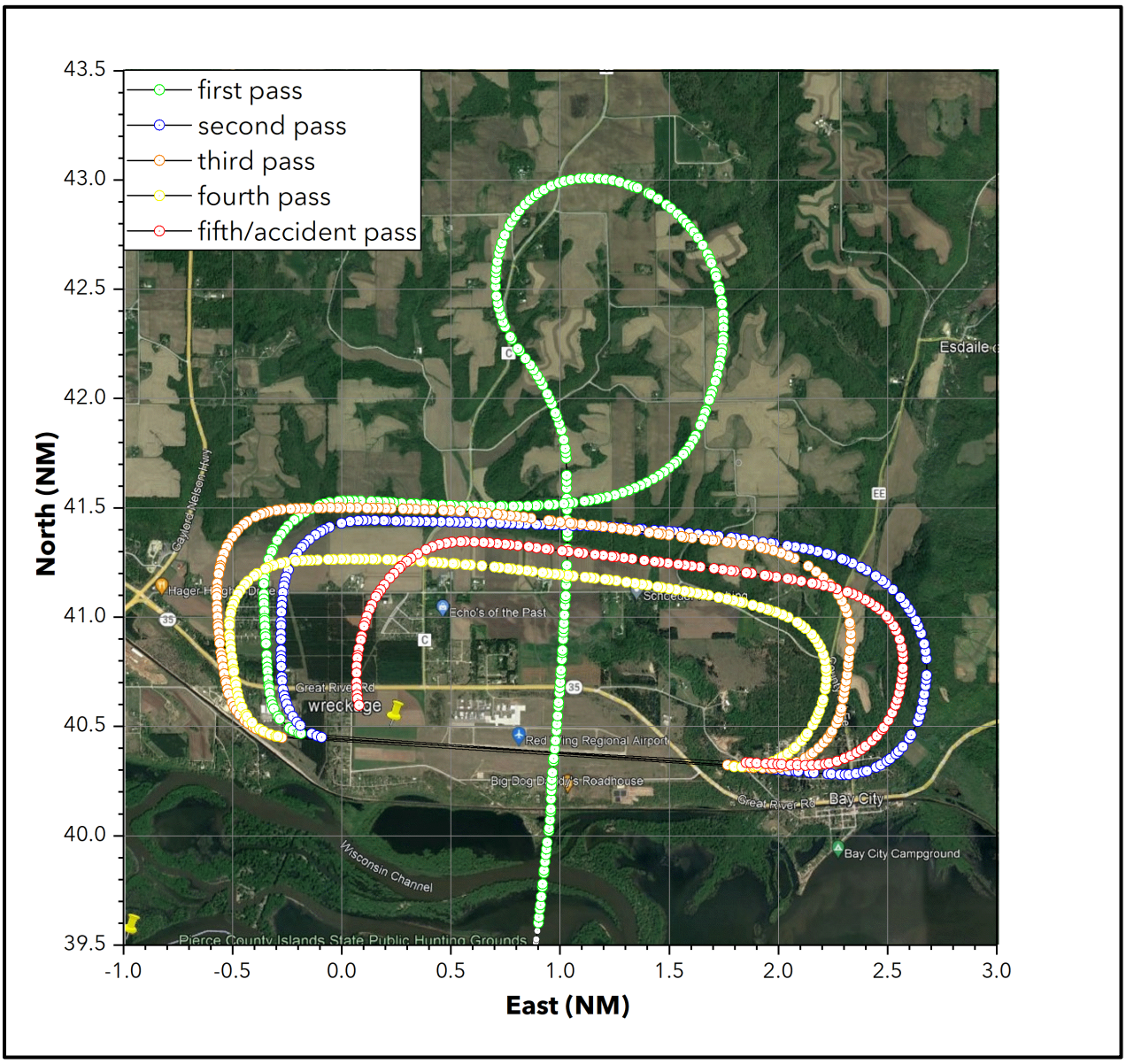

Figure 1: Pattern Work in the Left Traffic Pattern to Runway 9 at Red Wing Regional Airport and Wreckage

Figure 2: Accident Airplane, N11HC, an Experimental Glasair Super II SFT

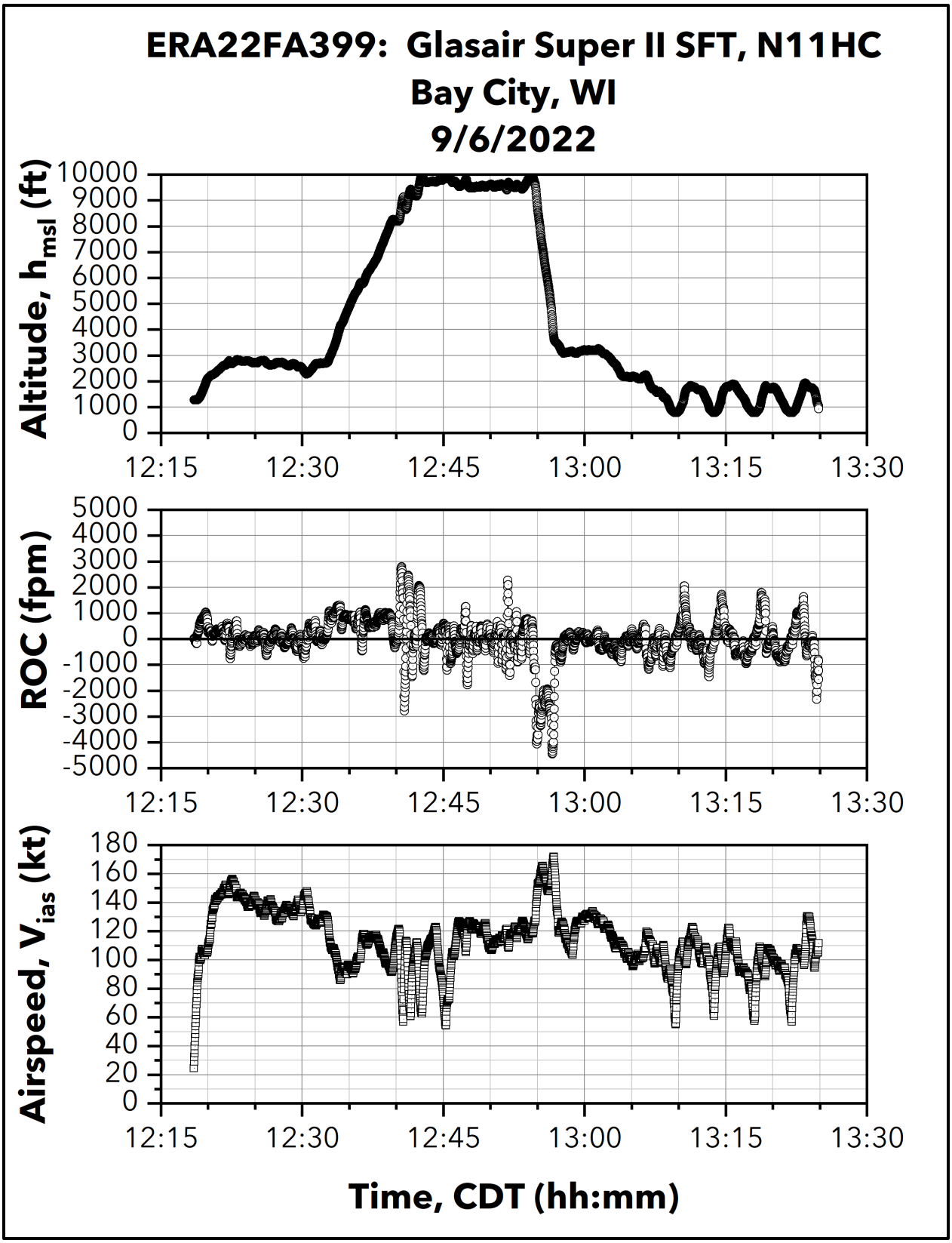

Figure 3: Garmin G3X Altitude, ROC, and Airspeed for Accident Flight

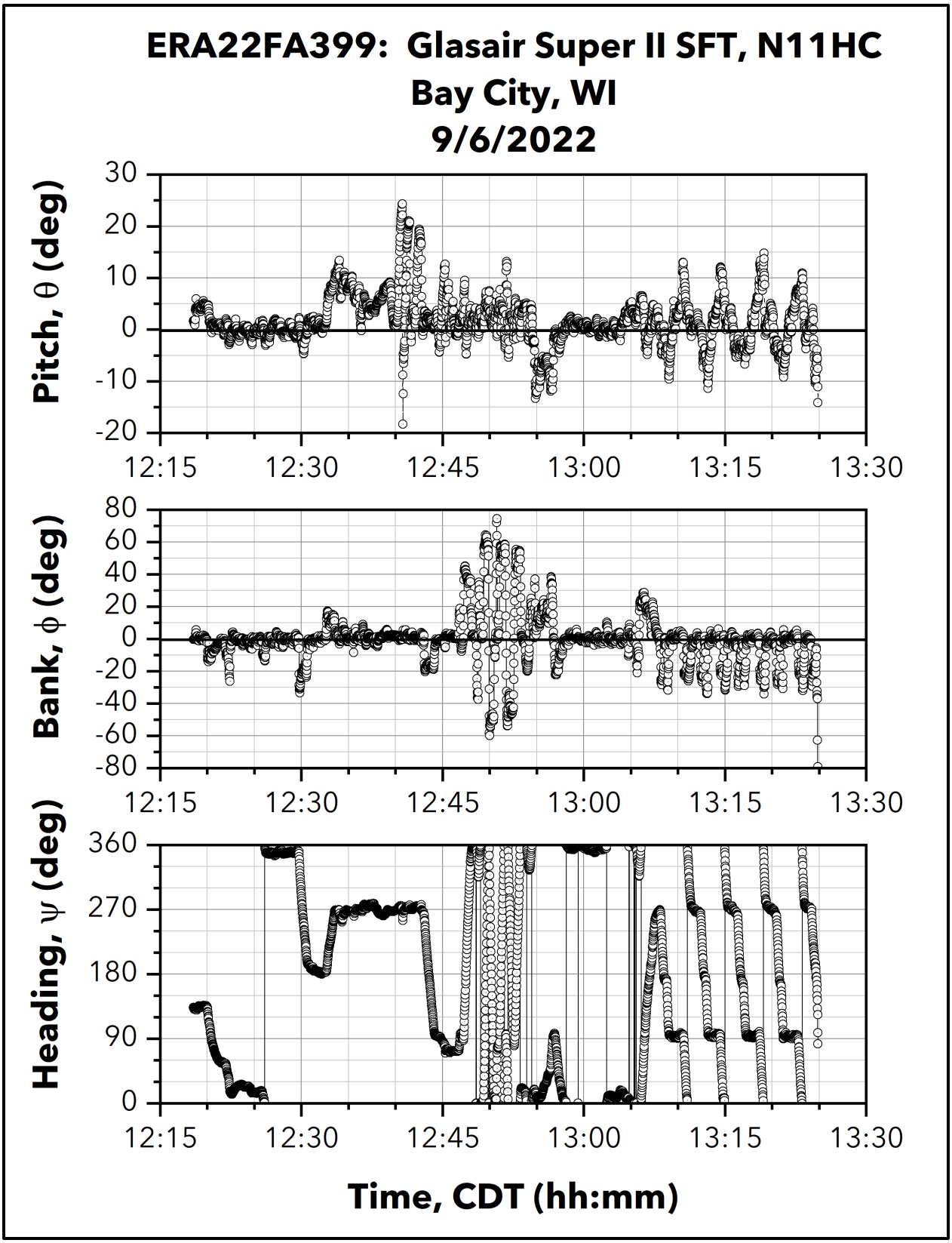

Figure 4: Garmin G3X Pitch, Bank, and Heading Angles for Accident Flight

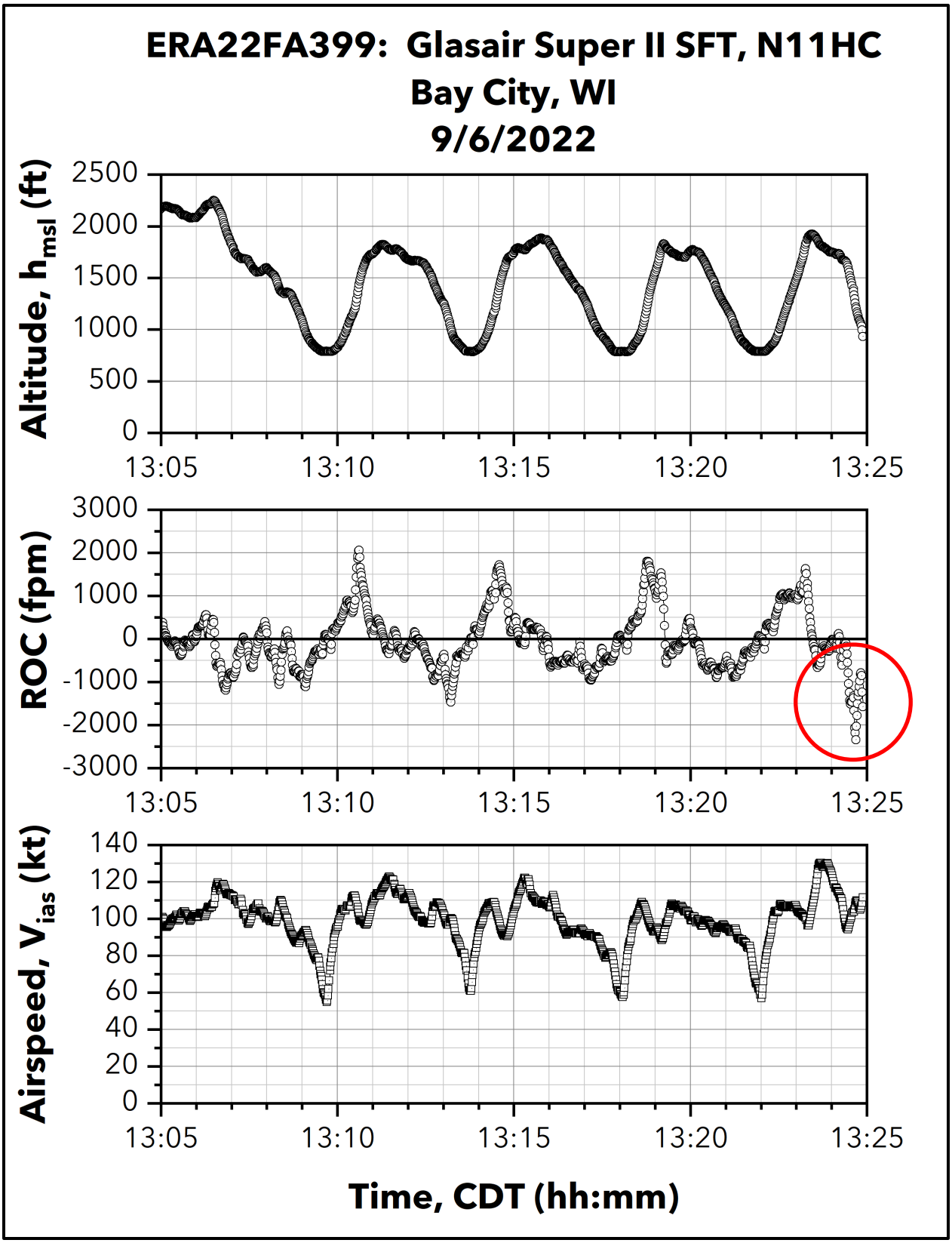

Figure 5: Garmin G3X Altitude, ROC, and Airspeed for Pattern Work

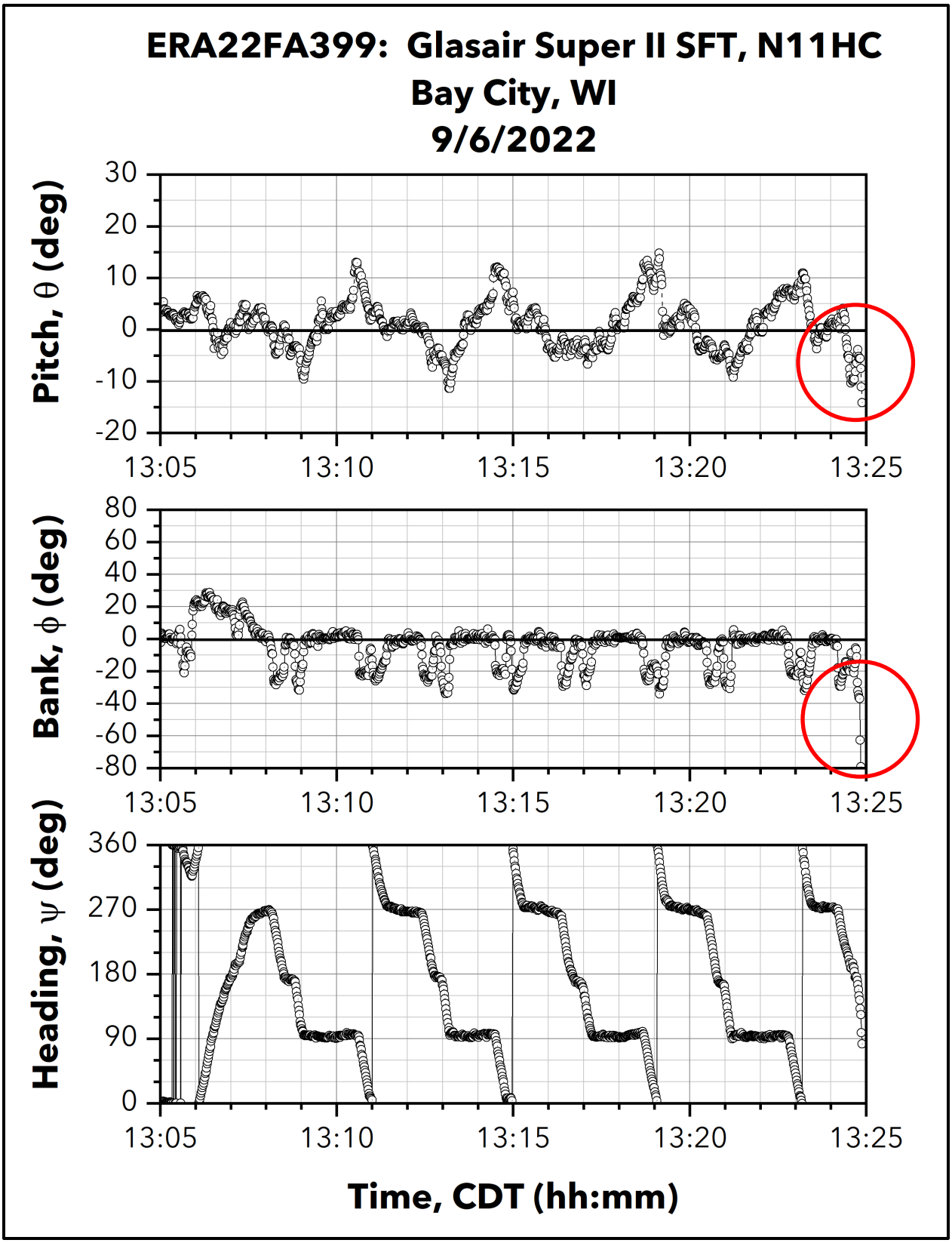

Figure 6: Garmin G3X Pitch, Bank, and Heading Angles for Pattern Work

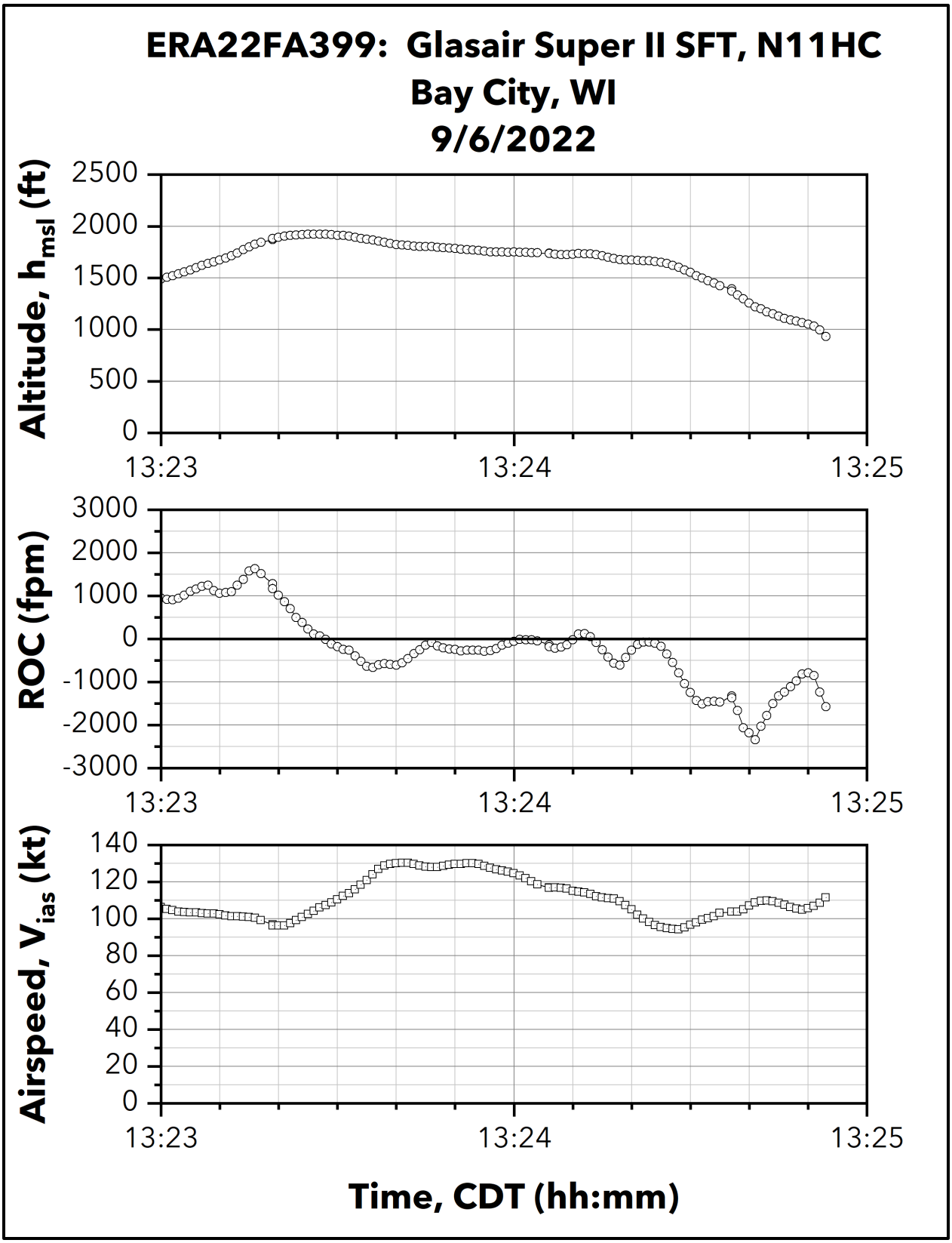

Figure 7: Garmin G3X Altitude, ROC, and Airspeed for Last Approach

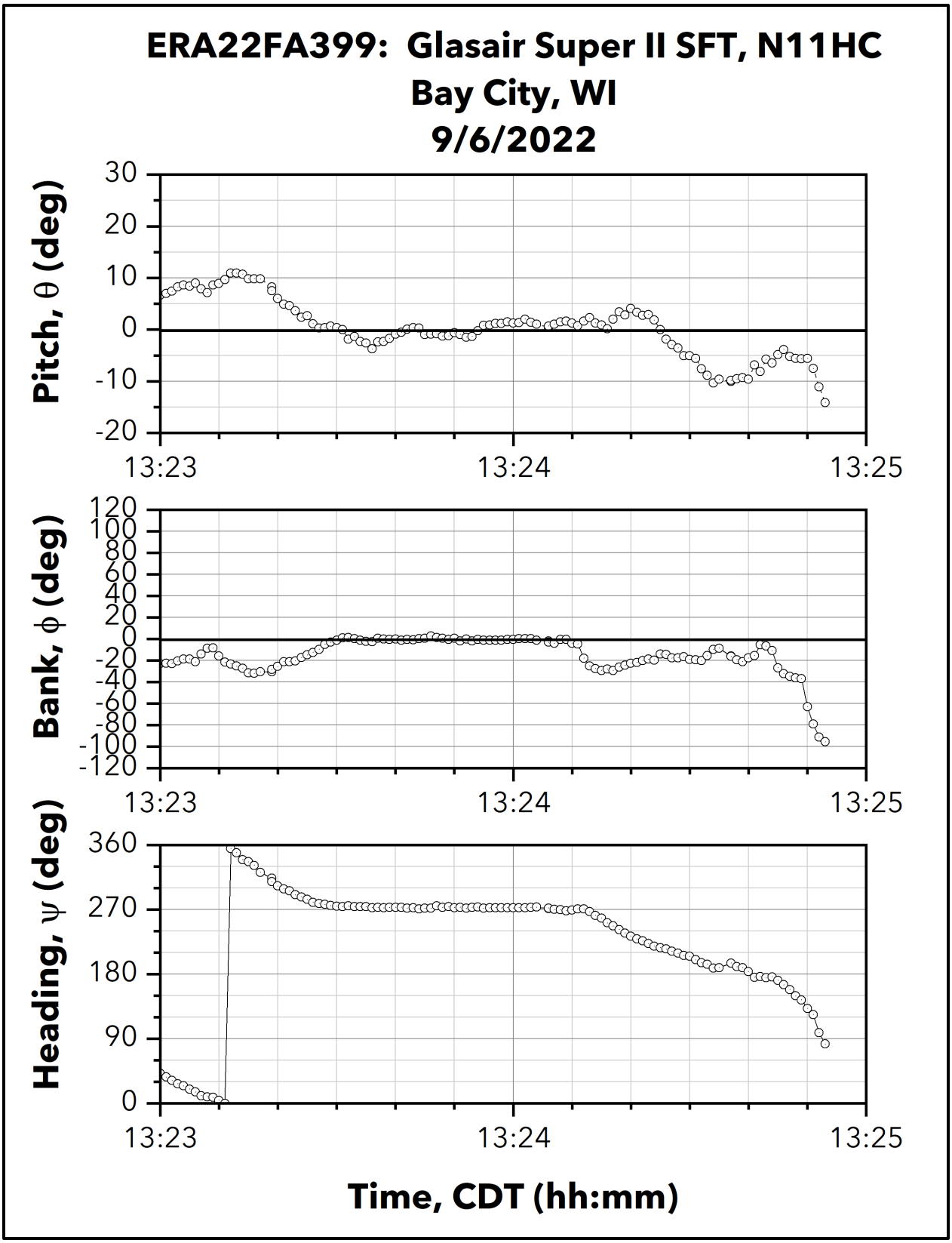

Figure 8: Garmin G3X Pitch, Bank, and Heading Angles for Last Approach

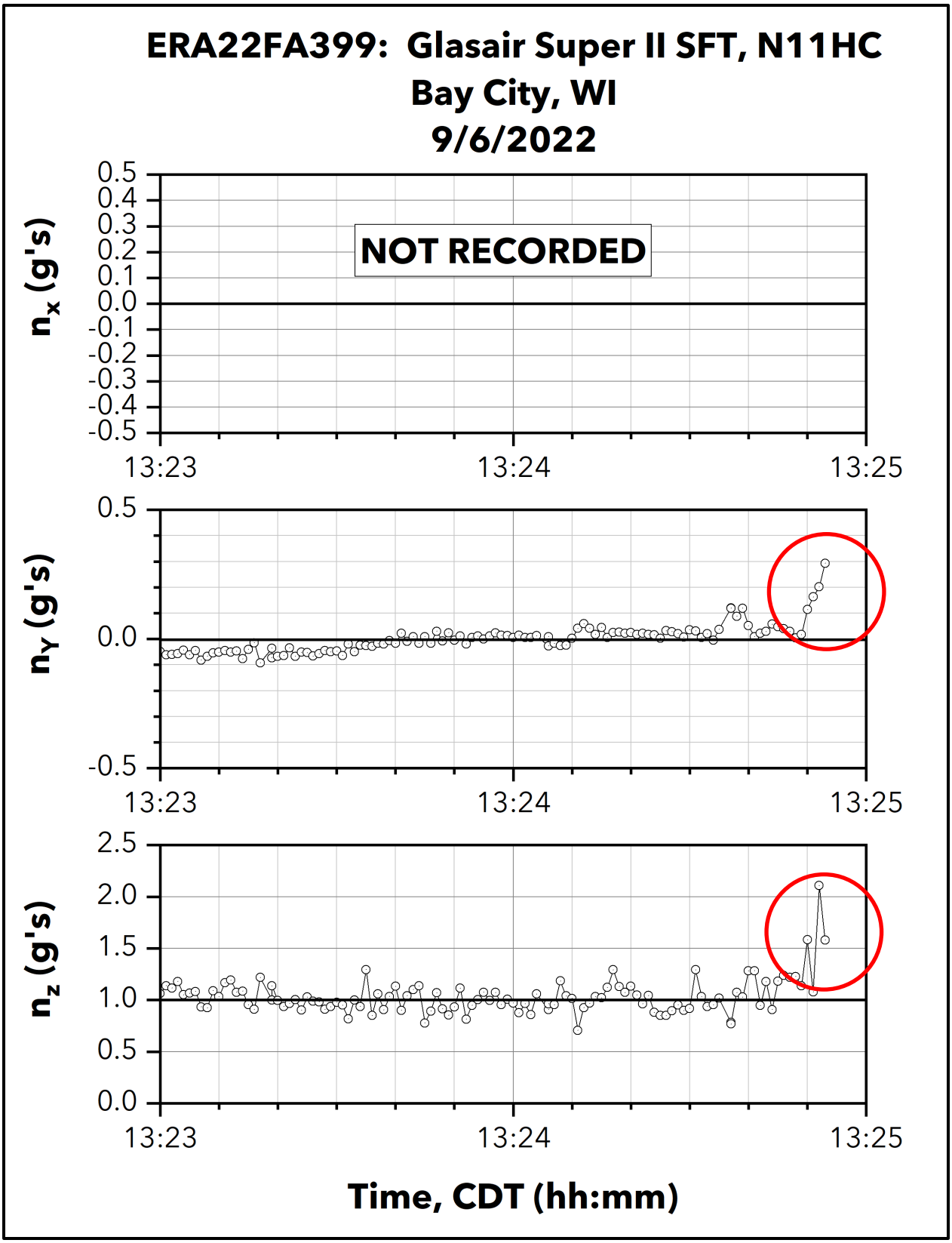

Figure 9: Garmin G3X Accelerations for Last Approach